APPLICATION NOTE

INTRODUCTION

A renewed global interest in space exploration is being driven by the search for new resources. The United States, India, Russia, and China have all planned a return to the moon, with a short-term objective of uncovering water to sustain long-term manned missions. Along with the renewed interest comes the development of new technologies to support the exploration, including new communications systems for spacecraft in lunar orbit and for communicating with earth-based relay stations.

THE CHALLENGE

Satellite communications systems are tested in laboratories before launch. Satellite channel emulators are used to emulate the impairments the signal will encounter during its travel, including time delays, Doppler, and multipath reflections, and typically have a maximum RF link emulation time of 1.2 seconds.

The moon is far from the Earth; round-trip communication takes 2.56 seconds. Additionally, one-way communication time to the first Lagrange point (L1), where the gravities of the Earth and the sun balance, takes 7.5 seconds.

THE SOLUTION

dBmCorp's state-of-the-art satellite channel emulator, the ACE9600, uses decimation to achieve up to 11.2 seconds of delay time, 4x the round-trip time to the moon and back, and 1.5x the first Lagrange point. The ACE9600 enables comprehensive communications system testing in the laboratory environment for renewed space exploration applications.

Application

> Satellite channel emulation for lunar and translunar communication

Solution

> ACE 9600 advanced channel emulator

Feature & Benefits

> Up to 11.2 seconds of delay time